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Filed : February 5, 2001

### **REMARKS**

Claims 1 and 27 have been amended to clarify the invention. Support for the amendments to Claim 1 can be found on page 22, lines 10-12 of the specification, for example. Support for the amendments to Claim 27 can be found on page 94, lines 21-26 of the specification, for example. Claims 3, 5, 6 and 8 have been amended to correct minor errors. Claims 31-35 have been added. Support for Claim 31 can be found on page 22, lines 12-19 of the specification, for example. Support for Claims 32, 33, 34, and 35 can be found in Claims 3, 4, 6 and 8, respectively. Accordingly, Claims 1-10, 27-29 and 31-35 are pending in this application. The amendments do not constitute the addition of new matter to the specification. Applicant respectfully requests entry of the amendments and reconsideration of the application in view of the amendments and the following remarks.

#### **Information Disclosure Statement**

In this Office action, the Examiner asserts that page 3 of the specification recites numerous foreign patents, at least some of which are not provided on an information disclosure statement. Applicant has submitted a copy of the references as an IDS herewith. It is respectfully requested that the references be considered.

#### **Specification Objection**

The specification is objected to because of the term "400 Ah/cm<sup>3</sup>" in Claim 3 which should be "400 mAh/cm<sup>3</sup>". Claim 3 has been amended to correct the informality, thereby obviating the objection. It is respectfully requested that the objection be withdrawn.

#### **Claim Objection**

Claims 27-29 are objected to because these claims are dependent on canceled Claim 11. These claims have been amended to correct the errors, thereby obviating the objection. It is respectfully requested that the objection be withdrawn.

#### **Rejection of Claims 3, 5 and 6 Under 35 U.S.C. § 112**

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Claims 3, 5 and 6 have been rejected under 35 U.S.C. § 112, second paragraph, because of typographical errors. These claims have been amended to correct the errors, thereby obviating the rejection. It is respectfully requested that the rejection be withdrawn.

Rejection of Claims 1, 2 and 9 Under 35 U.S.C. § 102

Claims 1, 2 and 9 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. patent No. 5,569,520 (Bates). Claim 1 has been amended for clarification. Claims 2 and 9 are dependent on Claim 1. The claims as amended herein could not be anticipated by Bates as explained below.

In the invention of Claim 1 as amended herein, the negative electrode of the secondary battery is made of a material capable of being doped and undoped with lithium. In contrast, in Bates, the negative electrode of the rechargeable lithium batteries is itself a lithium anode film (see column 1, line 14; column 2, lines 23, 33, and 38-39; and column 3, lines 39-40). A lithium secondary battery using metallic lithium as a negative electrode is less reliable than a lithium ion battery in terms of safety and cycle characteristics (see page 2, lines 8-13 of the Applicant's specification). Further, lithium secondary batteries using metallic lithium as a negative electrode have problems making them difficult for practical use (see column 1, lines 21-34 of U.S. patent No. 5,451,477 cited by the Examiner). Bates does not disclose using a negative electrode made of a material capable of being doped and undoped with lithium. Since Bates fails to disclose every element of the claimed invention, withdrawal of the rejection under 35 U.S.C. § 102 is respectfully requested.

Rejection of Claims 5 and 7 Under 35 U.S.C. § 103

Claims 5 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bates and EP 0808798-A2 (EP '798). Claims 5 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bates in view of JP 06-295744 A (JP '744). Claims 5 and 7 are dependent on Claim 1. These claims could not be obvious over the references as explained below.

As mentioned above, Bates does not teach or even suggest using a negative electrode made of a material capable of being doped and undoped with lithium.

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EP '798 or JP '744 discloses a lithium ion secondary battery having a negative electrode made of a material which can be doped and undoped with lithium. However, such a lithium ion secondary battery has an energy capacity of 10 Wh or smaller, which is too small for a secondary battery for an energy storage system.

In the case of a large lithium ion secondary battery (energy capacity of 30 Wh or larger, and a volume energy density of 180 Wh/l or higher) for an energy storage system, heat is easily retained by the battery due to Joule heat caused by the internal resistance of the battery in charging or discharging or internal heat of the battery due to change of the entropy of the active material due to incorporation or depletion of lithium ions. Therefore, the difference between the temperature of the inner portion of the battery and the temperature nearby the surface of the battery increases and accordingly internal resistances differ. As a result, charge capacity or voltage fluctuates readily. These problems are not taught by EP '798 or JP '744, nor a solution to these problems. Thus, one skilled in the art would not have a reasonable expectation of successfully producing a high storage capacity secondary battery with acceptable charge capacity and voltage stability. Absent such a reasonable expectation of success, no prima facie showing of obviousness can be set forth. See M.P.E.P. § 2143.02.

The invention recited in Claim 1, 5 or 7 provides a non-aqueous secondary battery having a large capacity of 30 Wh or larger and a volume energy density of 180 Wh/l or higher with superior and safety in heat radiation characteristics.

In view of the foregoing, no prima facie showing of obviousness can be established by the combination of Bates with EP '798 or JP '744. Thus, Claims 1, 5 and 7 could not be obvious over the references. It is respectfully requested that the rejection be withdrawn.

#### Rejection of Claim 6 Under 35 U.S.C. § 103

Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bates in view of EP 0808798-A2 (EP '798) and in further view of ..... However, the Examiner fails to indicate the last reference and a reason to reject Claim 6. Further, as discussed in the following section of Allowable Subject Matter, Claim 6 is considered to be allowable if properly rewritten. Thus, it is believed that the rejection of Claim 6 is an error. Applicant respectfully requests withdrawal of the rejection.

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Rejection of Claim 10 Under 35 U.S.C. § 103

Claim 10 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bates in view of U.S. patent No. 6,040,078 (Fauteux).

The Examiner asserts that Fauteux discloses of a battery casing having a thickness between 0.3 and 0.4 mm. However, Claim 10, dependent on Claim 1, recites the distinct features of Claim 1, and additionally recites the thickness of a battery case. Although Fauteux teaches the thickness of a battery case, as described above, the other distinct features recited in Claim 1 are not disclosed or suggested. Thus, a combination of the references still could not lead to the present invention. Applicant respectfully requests withdrawal of this rejection.

Rejection of Claims 27-29 Under 35 U.S.C. § 103

Claims 27-29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bates in view of U.S. patent No. 6,156,459 (Negoro).

The Examiner asserts that Negoro teaches of monitoring and controlling parameters of the cell including internal pressure, overcurrent and overcharging and discharging of the cell. However, Claims 27-29, dependent ultimately on Claim 1, recite the distinct features of Claim 1. Although Negoro teaches monitoring and controlling parameters of the cell, as described above, the other distinct features recited in Claim 1 are not disclosed or suggested. Thus, a combination of the references still could not lead to the present invention. Applicant respectfully requests withdrawal of this rejection.

In addition, Claims 27-29 are patentable for the additional reasons explained below. Although Negoro teaches monitoring and controlling parameters of the cell, Negoro does not teach a step of measuring at least one operational parameter at at least two points in a single cell of a battery as recited in Claim 27 as amended herein. In the case of a large secondary battery (energy capacity of 30 Wh or larger) for an energy storage system, the capacity, volume, and electrode area for each single cell are ten times or more greater than those of a small battery for a portable device and the fluctuation of operational characteristics in a single cell, which is not a great problem for a small secondary battery, reaches levels that cannot be ignored. To solve this problem, the invention recited in Claim 27 comprises a step of measuring at least one operational

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parameter at at least two points in a single cell of the battery. Negoro does not teach such a problem nor such a step.

Allowable Subject Matter

Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 35 as added newly corresponds to an independent claim including all of the limitations of Claim 8. Thus, Claim 35 should be allowable.

Claims 3, 4 and 6 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. Claims 32-34 as added newly correspond to independent claims including all of the limitations of Claims 3, 4 and 6, respectively. Thus, Claims 32-34 should be allowable.

CONCLUSION

In light of the Applicant's amendments to the claims and the foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

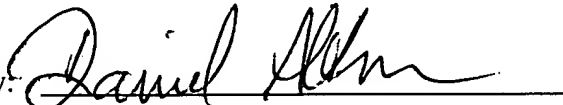
Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: February 23, 2004

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